THE RIGHT TO WATER AND CLIMATE CHANGE 2025

THE ARAB WATCH REPORT ON ECONOMIC AND SOCIAL RIGHTS

THE RIGHT TO WATER IN YEMEN:
CONFLICT, CLIMATE CHANGE, AND VULNERABILITY

Dr. Musaed Aklan
Senior researcher

Dr. Ali Aklan
Researcher

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Arab NGO Network for Development
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This report is published as part of the Arab NGO Network for Development's Arab Watch Report on Economic and Social Rights (AWR) series. The AWR is a periodic publication by the Network and each edition focuses on a specific right and on the national, regional and international policies and factors that lead to its violation. The AWR is developed through a participatory process which brings together relevant stakeholders, including civil society, experts in the field, academics, and representatives from the government in each of the countries represented in the report, as a means of increasing ownership among them and ensuring its localization and relevance to the context.

The seventh edition of the Arab Watch Report focuses on the right to water. It was developed to provide a comprehensive and critical analysis of the status of this right across the region, particularly in the context of climate change and its growing impacts. The information and analyses presented aim to serve as a platform for advocacy toward the realization of this fundamental right for all.

The views expressed in this publication are solely those of the author and do not necessarily reflect the positions of the Arab NGO Network for Development (ANND), Brot für die Welt, or Norwegian People's Aid.

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Senior researcher

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Researcher

Dr. Musaed Aklan is a senior researcher on water, the environment, and climate change. He holds a PhD in hydrology and historical water techniques from IHE-Delft and Wageningen University in the Netherlands and a master's degree in integrated water resources managemen from Cologne University in Germany. Dr. Aklan supports sustainable sources and practices, particularly in regions facing severe water scarcity and climate change impacts, like the Middle East. His research highlights the reasons behind traditional water technologies' decline and ways to revive them, emphasizing their role in groundwater conservation, climate adaptation, flood mitigation, drought resilience, and affordability for local communities. Dr. Musaed has over 15 years of work/research experience with INGOs and international institutions in different countries including Netherlands, Yemen and Jordan.

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INTRODUCTION

Access to sufficient, safe, acceptable, physically accessible, and affordable water is a fundamental human right, as recognized by United Nations General Assembly Resolution 64/292 and enshrined within the Sustainable Development Goals (SDGS), notably SDG 6, which calls for "clean water and sanitation for all" [UN 2010]. However, this right remains a distant hope for most Yemenis, as daily life involves a challenging search for this vital resource[Weiss et al. 2015]. Water scarcity in Yemen today is not just a crisis; it is a matter of survival. It has dramatically worsened due to miss management, political instability, economic decline, ongoing conflict, and the increasing effects of climate change [Oukhija et al. 2024]. Today, Yemen is facing one of the most severe humanitarian crises in the world. At the central of this crisis is a worsening water shortage[UNDP], With 17 million (more than 40% of the country's population) without access to enough water to cover basic daily needs [OCHA, 2025]. The deterioration of Yemen's right to water is at a critical point, jeopardizing the lives and livelihoods of most Yeminis particularly vulnerable communities including women, children and Internally Displaced Persons (IDPs).

Yemen is in arid and semi-arid regions, and historically, limited water resources have always posed a challenge to sustainable water management [ALjawzi et al. 2022]. This naturally dire situation is worsened by complex interplay of many other factors. Unsustainable agricultural practices, particularly the widespread cultivation of qat (a water-intensive cash crop), inefficient flood irrigation techniques, and a lack of effective water resource management, led to the severe overexploitation of groundwater aquifers, the nation's primary water source, resulting in an annual decline ranging from 2 to 8 meters in most basins. Rapid population growth, rural-urban migration and unplanned urbanization are other factors intensified the pressure on dwindling water resources [Oukhija et al. 2024]. This dire situation, which worsened by years of conflict and the growing effects of climate change, hinders equitable distribution of water and has increased conflicts and tensions.

This study seeks to identify the root causes behind the deterioration of the right to water in Yemen, examine how access, availability, and quality of water resources, along with their management, have been impacted by ongoing conflict and climate change, assess the roles played by state institutions and international development actors in addressing these issues, and how these intertwined challenges affect vulnerable communities. This study employs desk review of literature and the collection of primary data, which included key informant interviews with 10 respondents including officials, academics, farmers, Water Users Organization, and civil society mem-

bers. The study concluded with a set of recommendations to improve right to water, resilience, and promote sustainable water governance in Yemen.

02

RIGHT TO WATER IN THE YEMENI CONTEXT

The right to water means that everyone is entitled to sufficient, safe, acceptable, accessible, and affordable water for personal and domestic uses. In the context of Yemen, this right is severely constrained by water scarcity, conflict, climate change and institutional fragility. Yemen is among the most water-scarce countries globally, and millions lack access to safe drinking water and sanitation services.

Despite the data gaps, there are some evidence-based figures related to the right to water in Yemen. According to SDG 6 indicators, only approximately 60% of the population have safe drinking water services and sanitation facilities, (SDG6 Data, 2024; SESRIC, 2020). Water quality is critically compromised, with only 38% of monitored water sources meeting good quality standards, and only 28% of domestic wastewater being treated (SDG6 Data, 2024). Data on affordability and time spent collecting water are limited, but evidence suggests that a substantial portion of households, mainly in rural areas, where majority of population are, spend over 30 minutes per round trip to collect water and many rely heavily on costly water truckers (UNICEF, 2022). The sustainability of Yemen's water resources is alarmingly, with renewable per capita water availability at just 74 cubic meters per year and extraction rates of resources far exceeding renewable supplies/recharge, creating extreme water stress (SDG6 Data, 2024). These indicators illustrate that Yemen's water scarcity is multi-dimensional, encompassing insufficient access, poor quality, inequitable distribution, and unsustainable use, highlighting the severe challenges to realizing the human right to water in a fragile, conflict-affected and climate-stressed context.

03

ROOT CAUSES FOR THE DETERIORATION OF THE RIGHT TO WATER IN YEMEN

NATURAL SCARCITY AND RESOURCE LIMITATIONS

Yemen's natural water resources are inherently limited by its arid to semi-arid climate and has low and unpredictable rainfall. Water availability in Yemen is one of the most pressing humanitarian and environmental crises worldwide. With no rivers or permanent surface water, the average annual rainfall is only 167 millimeters, and its annual per capita renewable water availability is only 74 cubic meters [Global Economy 2021]. These figures is alarmingly low level, below the Middle East and North Africa regional average and significantly contrasts with the internationally recognized water poverty threshold of 1,000 cubic meters per person per year [UNDP 2021]. In total, the average renewable water resources available in Yemen are about 2500 million cubic meters per year, while total water consumption is about 3400 million cubic meters per year, resulting in a deficit of about 900 million cubic meters per year [Aqlan et al. 2021]. This imbalance between limited renewable water resources and unsustainable levels of consumption requires comprehensive, well-governed water management policies that not only prevent further depletion and address sustainability but also uphold the fundamental human right to water and ensure equitable access for all.

OVEREXPLOITATION OF AVAILABLE RESOURCES AND EXPANSION OF AGRICULTURE LANDS

Groundwater aquifers have been the backbone of Yemen's water supply, catering to agricultural, domestic, and industrial needs [Al-Ghorbany et al. 2014]. However, the abstraction rate has far outstripped these aquifers' natural recharge capacity, leading to a precipitous decline in water tables across the country. For instance, in the heavily populated Sana'a Basin, the water table plummeted from approximately 30 meters below the surface in the 1970s to depths ranging from 200 to 1200 meters, a stark indicator of the severity of depletion [Aljawzi, et al 2022]. Groundwater drops two to eight meters each year. This over-extraction has not only reduced the quantity of available water but has also led to the deterioration of its quality, including increased salinity, rendering it less suitable for both human consumption and agriculture.

Agricultural policy and practice are significant factors contributing to this excessive overexploitation. Agriculture accounts for most water consumption in Yemen, which is estimated to be over 90% of total abstracted water compared to the global average of 70% [Varisco et al. 2019, FAO 2023]. The cultivation of Qat, a profitable yet water-intensive cash crop, significantly contributes to groundwater depletion. More than 30% of the water withdrawals go to Qat production. The high water consumption of Qat increases physical water scarcity by reducing the available surface and groundwater sources [FAO 2023]. This places the agricultural sector as the primary consumer of water, and despite its importance—particularly for rural populations that rely heavily on it—it carries a significant responsibility, especially given the expansion of irrigated agriculture, often favoring large farmers at the expense of smallholders, as well as low efficiency of irrigation, where flood irrigation is still the most commonly used.

In the past, government policies like subsidies for diesel fuel used in irrigation and the newly rapid increase of solar irrigation systems have unintentionally encouraged farmers to overuse groundwater. The illegal and uncontrolled drilling of private wells has worsened the problem, resulting in a careless rush to drain underground water [Aklan et al. 2021]. The unsustainable use of water resources, particularly groundwater is the primary driver of the current water scarcity crisis [Al-Ghorbany et al. 2014]. This unrestrained approach poses a serious threat to the long-term water rights and availability of water resources that are crucial for agriculture and local communities.

WEAK GOVERNANCE AND INSTITUTIONAL FAILURES

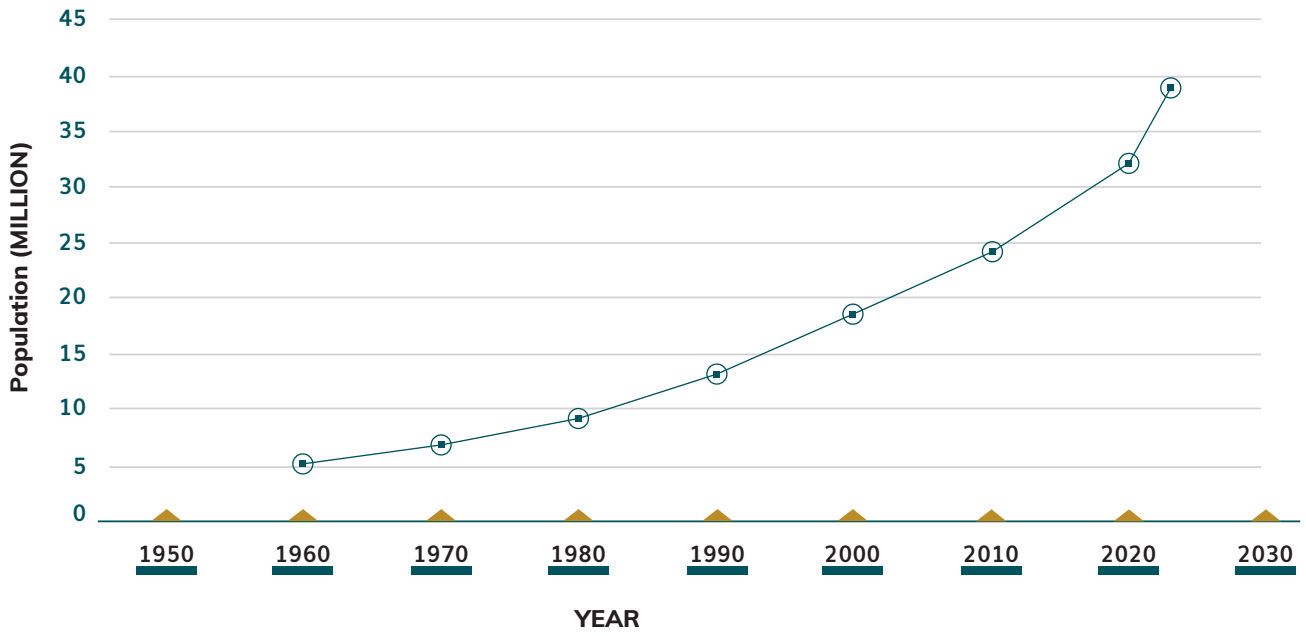
The overexploitation of water resources in Yemen has been enabled and perpetuated by systemic weaknesses in water governance and institutional frameworks. While Yemen has a good legal framework for water management, including the Water Law of 2002 and the National Water Sector Strategy and Investment Program (NWSSIP), the implementation and enforcement of these regulations have been lacking. Key institutions responsible for water management, such as the Ministry of Water and Environment (MWE) and the National Water Resources Authority (NWRA), have faced significant challenges. The NWRA, mandated to regulate water resources, issue permits, and monitor usage, has often been described as weak and lacking the capacity and political backing to enforce regulations, particularly against powerful interests and key individuals [Aklan et al. 2021].

Overlapping mandates, a lack of coordination between different government bodies (notably between the MWE, responsible for water resource management, and the Ministry of Agriculture, Irrigation and Fisheries (MAIF), the largest water user), and the influence of vested political and economic interests have further hampered effective water governance. For example, MAIF has often been seen as defending the interests of large-scale farmers and Qat producers, sometimes at odds with national water conservation goals. This institutional fragmentation and the absence of robust regulatory mechanisms and consistent monitoring have created an environmental threat, where unsustainable water use practices have thrived.

POPULATION GROWTH AND URBANIZATION

Yemen's rapid population growth and accelerating urbanization have significantly intensified pressure on the country's already scarce water resources. As shown in Fig.1, as of 2023, Yemen's population exceeded 34 million, nearly doubling from 18 million in 1990, with an annual growth rate of around 2.3% [World Bank, 2023]. This demographic expansion, coupled with rural-urban migration, has led to an unsustainable rise in water demand in urban areas but losses of indigenous agriculture and water knowledge/labor and practices in rural areas.

Fig.1. Yemen Population Growth



Urban centers such as Sana'a, Taiz, and Aden are especially impacted. Sana'a faces the most critical water shortage in Yemen and may become the world's first capital to run out of water. The city's groundwater levels are dropping by 6–8 meters per year, and some projections estimate its main aquifer may be exhausted within the next 10–15 years [Aljawzi et al. 2022]. Urban infrastructure has not kept pace with population growth. The absence of a reliable water network has resulted in a greater reliance on water trucking, a service that is often costly and unaffordable for low-income families. In areas affected by conflict, the price of water delivered by truck can be as much as ten times higher than that of piped water and of unreliable quality (Aklan, et al 2019).

Conflict-induced displacement has further concentrated population clusters in urban and peri-urban areas. Over 4.5 million people have been internally displaced since the war began [IOM, 2023]. This sudden influx has overwhelmed local water supply systems and placed additional stress on host communities, exacerbating pre-existing shortages and social tensions related to access to water.

CLIMATE CHANGE AND WATER AVAILABILITY

"Climate change is exacerbating both water scarcity and water-related hazards (such as floods and droughts), as rising temperatures disrupt precipitation patterns and the entire water cycle."[United Nations]

Yemen is among the most climate-vulnerable countries in the Middle East and North Africa (MENA) region. Annual rainfall in Yemen is extremely scarce, ranging from less than 50 mm per year in the coastal plain to 100–600 mm annually in the high plateau with an overall average of 180mm annually. In recent decades, rainfall has also been declining and becoming more unpredictable, especially during the hot, dry months from June to September.[YRCS, 2024]. The impacts of climate change are rapidly emerging as a critical threat. Global temperatures are rising at an alarming rate, and Yemen is particularly affected, experiencing increases between 0.2°C and 1.4°C during the 20th century. According to the IPCC Sixth Assessment Report, 2022, the Arabian Peninsula, including Yemen, is projected to see further temperature increases of 2.0 to 2.5°C by 2050 under moderate emissions scenarios. The rise in global temperatures is causing local temperatures in Yemen to increase, leading to higher evaporation/evapotranspiration rates and reduced effective recharge of surface and groundwater resources [AL-Falahi et al. 2024].

Rainfall patterns in Yemen are becoming increasingly erratic and are characterized by more extended drought periods and sudden, intense precipitation events. These events often result in flash floods, which contribute little to sustainable groundwater recharge due to high surface runoff and limited soil infiltration[YRCS 2024]. Such events also contribute to severe soil erosion, land degradation, and desertification, with some estimates suggesting that Yemen loses around 3% of its cultivable land to desertification annually. Coastal regions face the additional threat of cyclones and sea-level rise, projected to be up to 0.54 meters by 2100 [Reliefweb, 2023]. This increases the risk of saltwater intrusion into coastal aquifers, rendering freshwater sources brackish and unusable for drinking or irrigation without costly treatment.

The frequency and intensity of extreme weather events such as tropical cyclones, sandstorms, and locust infestations, which can devastate crops and infrastructure, are also reported to rise. These climatic shifts collectively place immense pressure on Yemen's fragile ecosystems and its predominantly rain-fed agricultural sector, a primary source of livelihood for a significant portion of the population.

The degradation of natural water catchments and deforestation due to conflict and overgrazing have weakened the country's capacity to retain water in the soil and recharge aquifers. This creates a dangerous feedback loop in which less water is absorbed into the ground, aquifers deplete more rapidly, and communities rely more on external or expensive sources.

IMPACT OF ONGOING CONFLICT ON WATER RESOURCES AND WEAPONIZATION

"Conflicts over water will become more common without science-based water diplomacy." (UN, 2023)

The ongoing war in Yemen has had a cat-

astrophic impact on the country's already strained water sector, turning an existing crisis of scarcity and mismanagement into an acute humanitarian emergency. While Yemen is one of the most water-scarce countries globally, with per capita availability at just 74 m^3/year [FAO's Aquastat, 2021], the conflict has further exacerbated vulnerabilities by impacting infrastructure, limiting access, and politicizing water resources [Aklan et al. 2021].

Water systems in Yemen were already fragile before the war and the war has further exacerbated their challenges. The overall figure of public water network coverage in Yemeni urban areas was 57% and only 44% in rural areas before the war. In most areas, water supply through the network is intermittent, and many residents rely on purchasing water from tanker trucks to cover the shortfall (Aklan et al, 2019). Water disputes have been a significant source of violence in Yemen, leading to an estimated 4,000 to 5,000 deaths annually, even before the current conflict began. Consequently, water scarcity has become one of the major causes of local conflict in the region [World Bank, 2023].

The ongoing war has significantly worsened the vulnerabilities that existed before [Al-Saidi et al. 2020]. The water systems/network coverage and related infrastructure, such as pipelines, reservoirs, pumping stations, and water treatment plants, have been significantly affected, directly (through targeting or restricted access) and indirectly (due to rising fuel prices[1], as well as increased maintenance, operational, and personnel costs). As a result, services have been severely impacted, and in some areas have completely ceased [Gleick et al. 2019; Aklan, 2019; UNICEF, 2018; Burki, 2016]. This destruction has severely disrupted services, leaving almost half of the country's population without access to clean water and sanitation [OCHA, 2025]. Fuel blockades and widespread insecurity have hampered the delivery of essential materials needed to maintain and operate water systems. Consequently, only 20% of public water and sanitation facilities remain fully functional [ICRC, 2022]. According to the World Health Organization, this breakdown in water security has had devastating humanitarian consequences, fueling outbreaks of waterborne diseases like cholera, which saw over 1.3 million suspected cases between 2017 and 2019, deepening water and food insecurity and malnutrition.

Water has been a casualty of war and a tool of war. Water has been used as a target and a weapon to control populations and territory [Remmits, 2021]. Number of attacks on water infrastructure appear to be deliberate rather than incidental. Water installations, including wells and pipelines, have been repeatedly targeted, often to render areas uninhabitable or deny access to opposition-held regions. Such attacks extend suffering long after violence subsides, as rebuilding this infrastructure requires significant time and resources [World Bank, 2020].

Beyond physical attacks, access to and control of water has been used for political leverage. Warring parties have diverted water to loyal communities, denied repairs in opposition areas, and used water as a tall of war [CIVIC, 2022]. In Taiz City, as one of main and most populated cities, the Houthis exerted control over key water sources outside the city, using access restrictions as part of broader siege dynamics, while within government-held areas, local powers and informal actors have captured groundwater wells and distribution networks, commodified water and selling it at high prices.

[1] Groundwater is the main source for domestic uses and fuel, and electricity are vital for water extraction and distribution

This has transformed water from a public service into a conflict-sensitive commodity, exacerbating vulnerability and deepening inequalities in access (ReliefWeb, 2023; Human Rights Watch, 2023). The conflict and collapse of centralized regulation has enabled powerful actors to exploit water scarcity as a mechanism of control, deepening grievances and increasing the risk of local conflict, especially between internally displaced persons (IDPs) and host populations [H. Oukhija 2024].

The collapse of water and sanitation infrastructure, combined with widespread displacement into overcrowded areas, has created ideal conditions for waterborne diseases. Yemen experienced the largest cholera epidemic in recent history, with over 2.5 million cases and nearly 4,000 deaths between 2016 and 2022 [WHO, 2025]. Uncovered rainwater basins have also contributed to the spread of dengue and malaria. The crisis has been further exacerbated by the breakdown of sewage disposal systems (operation and maintenance) and absence/suspension of garbage collection that has allowed solid waste to accumulate, both identified as key drivers of cholera transmission (World Bank, 2018). As a result, Yemen has experienced one of the largest cholera outbreaks globally since 2016 and continued resurgence in recent years (UNICEF, 2018; WHO, 2024). The burden is weighty on children and malnourished individuals, as diarrheal diseases from unsafe water exacerbate nutritional deficiencies, as will be discussed in section 5 of this report [Aborode et al. 2025].

04

ROLES OF STATE INSTITUTIONS AND INTERNATIONAL DEVELOPMENT ACTORS

The governance of Yemen's water sector involves a range of national institutions, international development, and humanitarian actors, with the latter's role having increased during the current war. However, the effectiveness of these institutions has been significantly undermined by decades of weak governance, overlapping mandates, and the prolonged conflict. This has worsened the division within institutions and damaged water infrastructure.

STATE INSTITUTIONS' ROLE IN WATER MANAGEMENT

Before the ongoing conflict, Yemen's water sector governance already suffered from institutional overlap and weak coordination. The war has further fractured these systems, resulting in parallel or non-functional authorities in different regions [MI Weiss et al. 2015].

▪ NATIONAL WATER RESOURCES AUTHORITY (NWRA)

Under MWE, The NWRA is the central regulatory body responsible for water planning, licensing, quality monitoring, and law enforcement. However, its regulatory capacity has remained limited due to insufficient resources, political interference, and weak enforcement mechanisms. The institution has struggled to curb unregulated groundwater drilling, especially by powerful agricultural actors [Taher et al., 2012]. Since the conflict began, NWRA's operational capacity has deteriorated further, with its presence now varying across regions [Lackner & Al-Eryani, 2020].

▪ MINISTRY OF WATER AND ENVIRONMENT (MWE) AND MINISTRY OF AGRICULTURE, IRRIGATION AND FISHERIES (MAIF)

The MWE is tasked with policy development and water sector oversight including Local water corporations (LCs), NWSA and its branches, and NWRA and its branches. At the same time, MAIF (formerly MAI) oversees irrigation and agricultural water use, which accounts for 90% of the country's water consumption [D Varisco et al., 2019]. The two ministries have often been at odds. MWE and NWRA advocate for water demand management, whereas MAIF supports large-scale irrigation and water-intensive agricultural practices, including the cultivation of Qat. Conflicting

priorities and poor coordination between the ministries have hindered the implementation of the National Water Sector Strategy and Investment Program (NWSSIP), which MAIF has not fully supported despite official endorsement [Zeitoun et al., 2012].

With the current war, and despite the accompanying challenges, a degree of alignment has emerged between those overseeing both MWE and MAIF, which has reduced the disagreements that existed in the past. In Sana'a, under Houthi control, the Ministry of Water and Environment was completely abolished, and its responsibilities were distributed among several other ministries and other administrative bodies. This action threatens, or has effectively undone, more than two decades of work on developing and reforming the water sector. It disrupted coordination, undermined long-term water management and environmental oversight, and erased decades of institutional expertise, leaving the sector increasingly dependent on humanitarian actors rather than structured development.

LOCAL SYSTEMS AND WATER USER ASSOCIATIONS (WUAS)

Yemen has a rich history of indigenous water management systems, such as spate irrigation, rainwater harvesting terraces, and different type/size of water harvesting cisterns. These systems began to decline over the past few decades due to different factors, including government promotion of groundwater extraction and the neglect of traditional practices [Aklan et al., 2022]. Water User Associations (WUAs) in rural areas were meant to improve irrigation governance, but many have failed due to a lack of support, funding, and community trust. Nonetheless, in some regions, community-based systems have proven remarkably resilient and represent a critical opportunity for bottom-up water governance reform [Lackner, 2020].

Under the Ministry of Water and Environment, domestic water supply and sanitation services are managed by local water corporations and NWSA in urban centers and by the General Authority for Rural Water Supply Projects (GARWSP) and its local branches in rural areas. Despite these institutions, many rural areas still rely on community-managed wells and water points, and sanitation coverage remains limited. The ongoing conflict has further weakened infrastructure and service delivery due to war damage, fuel shortages, and revenue collection issues [Cooke, 2017]. Despite these challenges of the war, as well as water scarcity and successive climate crises, this decentralization in the water sector has helped sustain services, even at a minimal level. This is not the case when contrasting highly centralized public sectors, such as the electricity sector, which has almost completely stopped functioning due to the war. Humanitarian organizations and international actors have provided emergency support, such as water trucking, water points, and fuel, to maintain basic water services in some rural and urban areas yet needs remain largely unmet. (UNICEF, 202).

3.2 INTERNATIONAL INTERVENTIONS AND THEIR LIMITATIONS

International agencies have played a role in Yemen's water sector during ongoing war. However, the scope of their impact is constrained by funding gaps, limited access, and a focus on short-term humanitarian relief.

International organizations have contributed to supporting water sector and its related services during ongoing war. However, the scope of their impact is constrained by funding gaps, limited access, and a focus on short-term unsustainable humanitarian relief. Despite the prolonged duration of the war, the reliance on short-term, emergency interventions remain predominant. Moreover, these interventions are poorly coordinated and not proportionally distributed across all regions of Yemen.

UNICEF and WHO lead the Water, Sanitation and Hygin (WASH) Cluster in Yemen, coordinating emergency responses such as water trucking, rehabilitation of infrastructure, and cholera prevention campaigns [UNICEF2022]. FAO and UNDP supports agricultural water efficiency, while the World Bank and UNOPS have contributed to large-scale urban water system repairs. INGOs such as CARE, GIZ, Oxfam, and many local NGOs, implement frontline WASH programs. These interventions have helped but have largely prioritized emergency response over long-term sustainability [al-Mowafak et al, 2020].

COORDINATION AND LONG-TERM EFFECTIVENESS

Aligning the work of diverse international actors with national strategies remains a challenge, even with the existence of coordination structures. Emergency aid projects tend to operate in silos and are rarely integrated into national planning frameworks. The persistent focus on short-term survival needs prevents investment in durable water governance systems. Critics argue that without better integration, international aid risks entrenching dependency and failing to address the structural drivers of water insecurity [Abohajeb et al. 2025]. A shift towards climate-sensitive and conflict-sensitive development models is urgently needed to bridge humanitarian response and long-term resilience-building. More importantly, these interventions should operate within the framework of national and local plans and strategies, and through state institutions, which would help reduce brain drain of national institutions, ensure the sustainability of interventions and strengthen institutional and infrastructure capacity.

05

IMPACT OF WATER INSECURITY ON VULNERABLE COMMUNITIES

"Marginalized groups – women, children, refugees, indigenous peoples, disabled people and many others – are often overlooked by, and sometimes face active discrimination from, those planning and governing water and sanitation improvements and services."(United Nation).

The water crisis in Yemen disproportionately impacts the country's most vulnerable populations. Gender inequality, displacement, poverty, and marginalization intensify the burden of water scarcity, reinforcing existing social hierarchies and creating new forms of vulnerability. This further contributes to local tensions and conflict.

GENDERED BURDENS AND HEALTH RISKS

Women and children, specifically girls in Yemen, are responsible for fetching water in most households. As water becomes scarcer and due to war, this duty becomes increasingly time-consuming and dangerous. Many must spent 30 minutes to hours to reach sources and fetching water, often risking harassment or violence, particularly in insecure or conflict-affected areas [UN, 2025; Cooke, 2017]. In about 7 out of 10 households without water on premises, women and girls are responsible for water collection and girls under 15 are more likely than boys to perform this task (WHO, 2023).

This daily burden restricts their access to education and economic opportunities, reinforcing gender inequality and intergenerational poverty. The lack of private, safe sanitation facilities presents serious challenges for adolescent girls and women, impacting their dignity, safety, and health. Pregnant and lactating women are also particularly vulnerable, as inadequate access to safe water increases their risk of complications and infections [UNICEF, 2021; UNDP, 2022]. Children, especially under the age of five, are susceptible to diseases linked to poor water quality and hygiene, such as diarrhea. These infections contribute to Yemen's high rates of child malnutrition, as they impair nutrient absorption and increase vulnerability to illness [WHO, 2022].

DISPLACEMENT, MALNUTRITION, AND ENVIRONMENTAL STRESS

Around 4.5 million of Yemenis have been internally displaced due to both conflict and environmental factors like floods and droughts. Many live in informal settlements or overcrowded camps, where access to clean water and sanitation is minimal (IOM, 2020). These conditions create serious public health risks and strain local water resources, especially in vulnerable host communities. Tensions between displaced and resident populations over scarce resources are every day, especially in areas affected by repeated drought or flooding (ICRC, 2022).

The relationship between water insecurity and malnutrition is direct and devastating. Water scarcity limits many families' agricultural production, primary food source, and income. Droughts and floods continue to destroy crops, reduce livestock productivity, and force families to abandon farmland, undermining food availability and livelihoods [Lackner, 2020; Al-Mowafak, 2020]. In 2022, 17 million Yemenis faced acute food insecurity, with child malnutrition levels among the worst globally [UNSDG, 2022].

INEQUITY, LOCAL TENSIONS, AND WATER-RELATED CONFLICT

As water scarcity deepens, competition for access intensifies, particularly in rural areas where agriculture is a lifeline. Water-related disputes increasingly arise between communities, upstream and downstream users, farmers, and displaced people. The overexploitation of groundwater, often driven by influential individuals or groups who can afford to drill deeper wells, can dispossess poorer farmers or communities who rely on shallower wells or traditional water sources. This entrenches social inequality and breeds grievances and resentment. The breakdown of traditional dispute resolution mechanisms and the weakness of formal state institutions in managing water allocation and resolving conflicts exacerbate these tensions (World Bank, 2009].

Water disputes can escalate quickly, particularly in tribal regions with widespread arms and limited institutional authority. Without equitable water-sharing mechanisms and conflict-sensitive governance, these localized tensions risk undermining social cohesion and stability [Collin, 2016].

06

CONCLUSION

The human right to water in Yemen remains constrained by the intersection of extreme natural water scarcity, rapid population growth, protracted conflict-related direct/indirect impacts, weakened regulatory oversight, declining public service capacity, unfair distribution of resources, and climate variability characterized by erratic rainfall, prolonged droughts, and increasing cyclone and flood events. Yemen now ranks among the most water-scarce countries globally, with per capita water availability falling far below internationally recognized poverty thresholds. As reported, through SDG 6 indicators, access to safely managed water and sanitation services in Yemen remains limited, water quality is compromised, and resource use is highly unsustainable. Recent estimates indicate that approximately 17 million people lack reliable access to safe drinking water and sanitation services, reflecting the scale and persistence of the crisis. The right to water in Yemen is undermined not only by physical scarcity, but also by human made crisis/conflicts, and systemic/management failures in governance, service delivery, and resource management.

Yemen's water crisis is complex and intertwined with the country's broader, political, and environmental challenges. The crisis stems from decades of unsustainable groundwater extraction, driven mainly by inefficient irrigation practices, widespread cultivation of Qat, and weak regulatory enforcement. As a result, Yemen now ranks among the most water-scarce countries globally, with per capita water availability falling far below internationally recognized poverty thresholds. The crisis stems from decades of unsustainable groundwater extraction, driven mainly by inefficient irrigation practices, widespread cultivation of Qat, and weak regulatory enforcement. During current war, the deliberate targeting of water systems by warring parties, through sieges and attacks, has weaponized water access and inflicted suffering on civilians, in violation of international humanitarian law. Increasing climate impacts have also increased the suffering, led to displacement, and exacerbate the vulnerability of communities grappling with insecurity and poverty.

These crisis impacts are unevenly distributed, disproportionately affecting marginalized and vulnerable populations, including Women, children, rural communities and internally displaced persons, who bear the burden of water scarcity, often spending hours each day collecting water, missing out on education, and suffering from preventable waterborne diseases. The growing reliance on informal water markets illustrates both adaptive responses and emerging high risks, particularly in relation to public health, environmental degradation, and long-term sustainability. International and organizational interventions are largely emergency-driven and

unsustainable, often creating a degree of dependency on aid. Locals in many poor areas face acute challenges in accessing clean water and sanitation, while competition over dwindling resources fuels social tensions and localized conflict, threatening further destabilization.

07

POLICY RECOMMENDATIONS

Advancing the human right to water in Yemen depends not only on increasing water availability, but on addressing governance deficits, reducing inequalities, and implementing realistic solutions that align with the country's fragile, conflict-affected, and climate-stressed context. Addressing the right to water requires long-term administrative and programmatic efforts that involve clear standards and continuous monitoring while reflecting current constraints and building long-term resilience.

- Adopt a rights-based and indicator-driven local and international approach through monitoring frameworks (e.g. using SDG 6 indicators) to assess access, quality, affordability, and sustainability.
- Considering institutional fragility, support decentralized and community-based water governance structures to enhance service delivery, accountability, and equitable access, particularly in underserved and rural areas.
- Invest in feasible climate-resilient and low-cost water solutions such as smart agriculture practices, small, decentralized rainwater harvesting systems and managed aquifer recharge to address both scarcity and climate variability.
- Improve regulation and oversight of water systems by recognizing the role of private vendors, enforcement of laws related to well drilling and groundwater use, improving water quality control, affordability, and equitable access rather than replacing these systems.
- Integrate water rights, climate adaptation (drought management, flood risk reduction, and climate forecasting) into national and local water policy and planning to enhance long-term resilience.
- Prioritize vulnerable and marginalized populations (women, children and girls, internally displaced persons, and rural communities) recognizing their disproportionate exposure to water insecurity and service gaps.
- Strengthening local, national and international coordination and data systems, while addressing mandate overlaps and critical data gaps, particularly in affordability and access reliability.

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P.O.Box Mazraa 5792/14 Beirut, Lebanon